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| EXAMINER |
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ABDI, AMARA

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2609

| SHORTENED STATUTORY PERIOD OF RESPONSE | MAIL DATE  | DELIVERY MODE |
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

|                              |                               |                             |  |
|------------------------------|-------------------------------|-----------------------------|--|
| <b>Office Action Summary</b> | Application No.<br>10/765,130 | Applicant(s)<br>PARK ET AL. |  |
|                              | Examiner<br>Amara Abdi        | Art Unit<br>2609            |  |

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
  - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
  - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 28 January 2004.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-31 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-8, 10, 12, 14-15, 17-23, 25, 27, 29 and 30 is/are rejected.
- 7) ☒ Claim(s) 9, 11, 13, 16, 24, 26, 28 and 31 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 January 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>01/28/2004</u> . | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Drawings*

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description:

In figure 11, items **32** and **33** are not described in the specification

In figure 12, items **42,43,44,45**, and **46** are not described in the specification.

Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### *Specification*

2. The Abstract is objected to because it has more than 150 words.

Applicant is reminded of the proper language and format for an abstract of the disclosure.

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The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

### ***Claim Objections***

3. Claims 1-11 are objected to because of the following informalities:

(1) Claim 1, line 10, "**a** differential" should be changed to "**the** differential"; on line 11, "**a** pixel" should be changed to "**the** pixel";

(2) Claim 5, line 3, "**the** weighted" should be changed to "**a** weighted".

(3) Claim 9, line 8, "**a** pixel pair" should be changed to "**the** pixel pair", and on line 9, "**a** differential value" should be changed to "**the** differential value";

(4) Claim 12, line 21, "**a** differential value" should be changed to "**the** differential value".

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and

the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1,4-5,7,17, and 20-21 are rejected under 35U.S.C.103(a) as being unpatentable over Itoh (US 6,810,156) in view of Ichikawa (US 5,881,164).

(1) Regarding claims 1 and 17:

Itoh disclose an image interpolation device (column 2, line 27) and method (column 13, line 25), for use in generating additional pixel data from input image data (column 2, line 34); where a window of input pixel data is used to generate data for an additional pixel to be placed substantially in the center of the window (column 2, line 36-42), (the window of input pixel is interpreted as an edge candidate detecting means), where the display image comprising:

Memory elements capable of receiving a chain of input pixel data and storing at least the window of input pixel data, the window of input pixels including a plurality of pixels pairs each of which respectively represents an angle of correlation (column 5, line 1-3);

Instant angle detection circuitry of receiving the input pixel data stored in the memory elements and determining an instant angle having the highest correlation based on differential values of at least some of the pixel pairs, wherein the differential value is the difference between the values of pixels in the pixel pair (column 5, line 3-6), (the examiner interpreted that the instant angle detection circuitry has the same function as a pixel comparator);

Angle confirmation circuitry capable of determining an interpolation angle based on the instant angle and the substantial angle (column 5, line 10-22), (the examiner

interpreted that the angle confirmation circuitry has the same function as the combination of an edge detector and an edge verifier); and

An interpolator capable of determining the value of the additional pixel based on the value of pixels in the pixel pair corresponding to the interpolation angle (column 5, line 22-28), (the examiner interpreted that the interpolator data generator determines the value of the additional pixel, which the average of the two adjacent original pixels).

However, Itoh does not disclose the substantial angle detection circuitry capable of determining a substantial angle having the highest correlation based on filtered differential values of at least some of the pixel pairs as recited in claim 1.

Ichikawa teaches an image data processing method and image data processing apparatus, where the differential values of the image memory are filtered in the line segment emphasis filter (column 3, line 54-57). (The examiner interpreted that the substantial angle detection circuitry has the same function as the line segment emphasis filter).

One skilled in the art would have clearly recognized the filtering of the difference value of the image or the pixel pair (column 5, line 19-23). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine the system of Ichikawa, where the difference value of pixel pairs are filtered, in the system of Itoh, because in such feature a stripped brightness non-uniformities of a very low contrast can be detected accurately, as well as the use for inspection of an LCD (liquid crystal display) panel by which rubbing stripes can be detected selectively (column 3, line 19-20; and line 23-24).

(2) Regarding claims 4 and 20:

Itoh further discloses the generating as the interpolation angle the average of the instant angle and substantial angle (column 5, line 17-28) as described in claims 1 and 17.

However, Itoh does not disclose that the instant angle and the substantial angle are substantially equal to each other as recited in claims 4 and 20.

Ichikawa teaches an image data processing apparatus, where the instant angle (which is interpreted as the difference image memory) and the substantial angle (which is interpreted as line segment emphasis filter) appeared at equal interval (column 6, line 17).

One of ordinary skill in the art would have clearly recognized the system, where the instant angle and the substantial angle appear at equal interval (column 6, line 15-21). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine the system of Ichikawa, where the instant angle and the substantial angle are equal to each other, in the system of Itoh, because in such feature a stripped brightness non-uniformities of a very low contrast can be detected accurately, as well as the use for inspection of an LCD (liquid crystal display) panel by which rubbing stripes can be detected selectively (column 3, line 19-20; and line 23-24).

(3) Regarding claims 5 and 21:

Itoh discloses all the subject matter as described in claim 1,4,17, and 20 above.

However, does not disclose that the instant angle differs substantially from the substantial angle as recited in claims 5 and 21.

Ichikawa teaches an image data processing apparatus, where the substantial angle and the substantial angle substantially differs from each other (column 4, line 28-33).

One of ordinary skill in the art would have clearly recognized the system, where the instant angle and the substantial angle differ from each other (column 4, line 28-39). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine the system of Ichikawa, where the instant angle and the substantial angle substantially differ from each other, in the system of Itoh, because in such feature a striped brightness non-uniformities of a very low contrast can be detected accurately, as well as the use for inspection of an LCD (liquid crystal display) panel by which rubbing stripes can be detected selectively (column 3, line 19-20; and line 23-24).

(4) Regarding claim 7:

Itoh further discloses a system, where the instant angle detection circuitry includes:

A differential calculator capable of calculating differential value of at least some of the pixel pair in the window based on the pixel data stored in the memory elements (column 5, line 3-6), (the examiner interpreted that the instant angle detection circuitry has the same function as a pixel comparator).

6. Claims 2,6,18, and 22 are rejected under 35U.S.C.103(a) as being unpatentable over Itoh and Ichikawa as applied to claims 1 and 17 above, and further in view of Noguchi et al. (US 5,774,478).



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(1) Regarding claims 2 and 18:

Itoh and Ichikawa disclose all the subject matter as described in claims 1 and 17 above.

However, Itoh and Ichikawa do not disclose the determining of an image pattern, and do not disclose that the interpolation is based on the pattern image as recited in claim 2 and 18.

Noguchi et al. teaches an interpolation circuit for interpolating error data block, where the image pattern is determined (column 3, line 18-20), and the interpolation is based upon the arraying pattern estimated by the estimation means (column 3, line 21-24).

One of ordinary skill in the art would have clearly recognized the determining of general image pattern (column 5, line 18-22), wherein the interpolation is based in the general image pattern (column 6, line 34-36). Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to combine the system of Noguchi et al., where the image pattern is determined, in the system of Itoh, because such feature enlarge the number of quantization bits from the current 16 bits to 20 or 24 bits for transmitting a high quality audio signals. However, once the quantization bits are fixed at a pre-set value, the signal processing system is correspondingly designed, so that the number of quantization bits can hardly be increased (column 1, line 29-35).

(2) Regarding claims 6 and 22:

Itoh and Ichikawa disclose all the subject matter as described in claims 1, 17, 2, and 18 above.

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However, Itoh and Ichikawa do not disclose the system, where a low pass filter is capable of filtering the interpolation angle and generating a filtered interpolation angle as recited in claims 6 and 22.

Noguchi et al. teaches an interpolation circuit for interpolating error data block, where the analog filter is filtering the interpolated data and generating a filtered interpolation angle (column 6, line 46-49), (the interpolation angle is interpreted as the analog signal which is output at the monitor terminal).

One of ordinary skill in the art would have clearly recognized the system, where a filter is used for filtering the interpolation angle data and generating an analog signal (interpolation angle) (column 6, line 46-53). Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to combine the system of Noguchi et al., where filtering the interpolation angle, in the system of Itoh, because such feature enlarge the number of quantization bits from the current 16 bits to 20 or 24 bits for transmitting a high quality audio signals. However, once the quantization bits are fixed at a pre-set value, the signal processing system is correspondingly designed, so that the number of quantization bits can hardly be increased (column 1, line 29-35).

7. Claims 3 and 19 are rejected under 35U.S.C.103(a) as being unpatentable over Itoh, Ichikawa, and Noguchi et al. as applied to claims 1,2,17 and 18 above, and further in view of Sakurai et al. (US PG PUB 2005/0254650), and Yamashita et al. (US 5,347,599).

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Itoh, Ichikawa, and Noguchi et al. disclose all the subject matter as described in claims 1 and 2 above.

However, Itoh, Ichikawa, and Noguchi et al. do not disclose that:

- 1) The regional measurement circuitry detects alphabets or numerical character as recited in claims 3 and 19; and
- 2) The angle confirmation circuitry generates 90 degrees as the interpolation angle as recited in claims 3 and 19.

A) Regarding item 1):

Sakurai et al. teaches an authentication system, and method, where the background pattern determination part detects alphabets and numerical characters (paragraph [0191], line 3-4) (the regional measurement circuitry is interpreted to have the same function as background pattern determination part).

One of ordinary skill in the art would have clearly recognized the system, where the regional measurement circuitry detects alphabets or numerical characters (paragraph [0191], line 2-12). Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to combine the system of Sakurai et al., where the alphabets or numerical characters are detected, in the system of Itoh, because such feature has a high security where a widely popularized password composes of characters or numbers is used, there is little load for the user at the time of authentication, and the danger of a password being guessed by a third person is low even when an input value is looked by the third person at the time of authentication (paragraph [0007], line 4-9)

B) Regarding item 2):

Yamashita et al. teaches an adaptive interpolation method using correlation detection, where the angle confirmation circuitry generates 90 degrees as the interpolation angle (column 3, line 45).

One of ordinary skill in the art would have clearly recognized the system, where generating an interpolation angle of 90 degrees (column 3, line 43-49). Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to combine the system of Yamashita et al., where generating 90 degree as an interpolation angle, in the system of Itoh, because such feature detects more interpolation directions in the image regardless of the type of image, and can therefore smooth diagonal lines and increase the vertical resolution of the image (column 19, line 61-64) as well as provides a high resolution interpolation free of noise (column 20, line 6-7).

8. Claims 8,10,23, and 25 are rejected under 35U.S.C.103(a) as being unpatentable over Itoh and Ichikawa as applied to claims 1,7 and 17 above, and further in view of Matsugu et al. (US 6,757,444).

(1) Regarding claims 8 and 23:

Itoh discloses all the subject matter as described in claims 1,7, and 17 above. (The examiner interpreted that angle finding circuitry has the same function as the instant angle detection circuitry recited in claim 1 and 17).

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However, Itoh does not disclose the system, where the angle detection circuitry includes the lowest valley search circuit capable of determining the pixel pair in the window of pixels with the lowest differential value as recited in claims 8 and 23.

Matsugu et al. teach an image extraction apparatus method, where the pixel pair in the window of pixels is determined with the lowest differential value (column 27, line 65).

One of ordinary skill in the art would have clearly recognized the system, where the pixel pair in the window of pixels is determined with the lowest differential value (column 27, line 60-67). Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to combine the system of Matsugu et al., where the pixel pair in the window of pixels is determined with the lowest differential value, in the system of Itoh, because such feature can stably extract a subject image independently of any specific difference between the image characteristics of the background and subject without being influenced by the background pattern (column 3, line 25-29).

(2) Regarding claims 10 and 25:

Itoh and Ichikawa disclose all the subject matter as described in claims 1, 7, and 17 above.

(The examiner interpreted that angle finding circuitry has the same function as the instant angle detection circuitry recited in claims 1 and 17).

However, Itoh and Ichikawa do not disclose the system, where the angle detection circuitry includes the lowest valley search circuit capable of determining the

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pixel pair in the window of pixels with the lowest filtered differential value as recited in claims 10 and 25.

Matsugu et al. teach an image extraction apparatus method, where the pixel pair in the window of pixels is determined with the lowest filtered differential value (column 8, line 24-25; and column 27, line 65).

One of ordinary skill in the art would have clearly recognized the system, where the pixel pair in the window of pixels is determined with the lowest filtered differential value (column 8, line 22-25; and column 27, line 60-67). Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to combine the system of Matsugu et al., where the pixel pair in the window of pixels is determined with the lowest filtered differential value, in the system of Itoh, because such feature can stably extract a subject image independently of any specific difference between the image characteristics of the background and subject without being influenced by the background pattern (column 3, line 25-29).

9. Claims 12 and 27 are rejected under 35U.S.C.103(a) as being unpatentable over Itoh, Ichikawa, and Matsugo et al. as applied to claims 1,7, and 8 above, and further in view of Bobrov et al. (US PG PUB 2003/0128894)

Itoh, Ichikawa, and Matsugo et al. disclose all the subject matter as described in claims 1,7, and 8 above.

(The examiner interpreted that the interpolator capable of determining the value of the additional pixel has the same function as the interpolator described in claim 1).

However, Itoh, Ichikawa, and Matsugo et al. do not disclose a system, where the first valley detector capable of comparing the differential values of consecutive sets of immediately adjacent pixel pairs within the selected region and determining a pixel pair having a differential value that is smaller than the differential value of available immediately adjacent pixel pairs to the left and to the right in the selected region as recited in claim 12.

Bobrov et al. teaches a digital image analysis of reflecting markers, where comparing the differential values of adjacent pixels (paragraph [0088], line 6-7), and determining a pixel pair value having the differential value smaller than differential values of available immediately adjacent pixel pair in the selected region (paragraph [0088], line 18-19).

One of ordinary skill in the art would have clearly recognized the system, where comparing the differential values of adjacent pixels (paragraph [0088], line 6-11), and determining a differential value of pixel pair smaller than differential values of an adjacent pixel pair in the selected region (paragraph [0088], line 15-19). Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to combine the system of Bobrov et al., in the system of Itoh, because such feature uses form of binarization, which is more robust in comparison on the optical image light intensity oscillation of the image (paragraph [0088], line 22-23).

10. Claims 14 and 29 are rejected under 35U.S.C.103(a) as being unpatentable over Itoh (US 6,810,156) in view of Ichikawa (US 5,881,164).

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Itoh discloses all the subject matter as described in claims 1 and 17 above.

(The examiner interpreted that the interpolator that is capable of determining the value of the additional pixel, has the same function as the interpolator recited in claim 1).

However, Itoh does not disclose the substantial angle detection circuitry capable of determining a substantial angle having the highest correlation based on filtered differential values of at least some of the pixel pairs, where the substantial angle circuitry includes a recursive filter capable of filtering the differential values of at least some of the pixels pairs in the window and outputting the filtered differential values as recited in claims 14 and 29.

Ichikawa teaches an image data processing method and image data processing apparatus, where the differential values of the image memory are filtered in the line segment emphasis filter (column 3, line 54-57). (The examiner interpreted that the substantial angle detection circuitry has the same function as the line segment emphasis filter).

One skilled in the art would have clearly recognized the filtering of the difference value of the image or the pixel pair (column 5, line 19-23). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine the system of Ichikawa, where the difference value of pixel pairs are filtered, in the system of Itoh, because in such feature a stripped brightness non-uniformities of a very low contrast can be detected accurately, as well as the use for inspection of an LCD (liquid crystal display) panel by which rubbing stripes can be detected selectively (column 3, line 19-20; and line 23-24).



11. Claims 15 and 30 are rejected under 35U.S.C.103(a) as being unpatentable over Itoh, Ichikawa, and as applied to claims 1,7,8,17, and 23 above, and further in view of Matsugo et al. and Bobrov et al. (US PG PUB 2003/0128894).

Itoh, Ichikawa, and Matsugo et al. disclose all the subject matter as described in claims 1,7, 8,12,17, and 23 above.

(The examiner interpreted that angle finding circuitry has the same function as the instant angle detection circuitry recited in claims 1 and 8).

However, Itoh, Ichikawa, and Matsugo et al. do not disclose a system, where the first valley detector capable of comparing the differential values of consecutive sets of immediately adjacent pixel pairs within the selected region and determining a pixel pair having a differential value that is smaller than the differential value of available immediately adjacent pixel pairs to the left and to the right in the selected region as recited in claims 15 and 30.

Bobrov et al. teaches a digital image analysis of reflecting markers, where comparing the differential values of adjacent pixels (paragraph [0088], line 6-7), and determining a pixel pair value having the differential value smaller than differential values of available immediately adjacent pixel pair in the selected region (paragraph [0088], line 18-19).

One of ordinary skill in the art would have clearly recognized the system, where comparing the differential values of adjacent pixels (paragraph [0088], line 6-11), and determining a differential value of pixel pair smaller than differential values of an

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adjacent pixel pair in the selected region (paragraph [0088], line 15-19). Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to combine the system of Bobrov et al., in the system of Itoh, because such feature uses form of binarization, which is more robust in comparison on the optical image light intensity oscillation of the image (paragraph [0088], line 22-23).

***Allowable Subject Matter***

10. Claims 9,11,13,16, 24,26,28, and 31 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

11. The following is a statement of reasons for the indication of allowable subject matter:

The prior art of record does not teach or suggest determining the comparing of differential value of the pixel pair determined by the first valley detector and the differential value of the pixel pair representing a 90-degree correlation; and outputting 90 degree as the instant angle if the differential value of pixel pair determined by the first valley is greater than or the same as the differential value of the pixel pair representing the 90 degree correlation.

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***Conclusion***

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Eiho et al. (US 6,924,839) disclose an image processing method, using a Laplacian operation, a parameter  $k$  for controlling the size of the Laplacian to be subtracted from an original image.

Kim (US 6,268,933) disclose a reconstructing a secondary differential value image, being capable of correcting blurring at the contour portion of an original image to form an image having a sharp contour.


13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Amara Abdi whose telephone number is (571) 270-1670. The examiner can normally be reached on Monday through Friday 7:30 Am to 5:00 PM E.T..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shuwang Liu can be reached on (571) 272-3036. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Amara Abdi  
04/03/2007



**SHUWANG LIU**  
**SUPERVISORY PATENT EXAMINER**